

ABSTRACT OF THE DISCLOSURE

An improved ε -removal method is disclosed that computes for any input

5 weighted automaton A with ε -transitions an equivalent weighted automaton B with no ε -transitions. The method comprises two main steps. The first step comprises computing for each state “p” of the automaton A its ε -closure. The second step in the method comprises modifying the outgoing transitions of each state “p” by removing those labeled with ε . The method next comprises adding to the set of transitions

10 leaving the state “p” non- ε -transitions leaving each state “q” in the set of states reachable from “p” via a path labeled with ε with their weights pre- \otimes -multiplied by the ε -distance from state “p” to state “q” in the automaton A. State “p” is a final state if some state “q” within the set of states reachable from “p” via a path labeled with ε is final and the final weight $\rho[p] = \bigoplus_{q \in \epsilon[p] \cap F} (d[p, q] \otimes \rho[q]).$